

dislocations passing unrecognized, and all cases being attributed to injury of the brachial plexus. Since 1911, when the shoulder-joint injury was offered as the primary cause, this theory has made rapid progress.

8. It is very likely that sufficient traction on the head at birth to rupture the brachial plexus has never been applied in a successful delivery.

### SIXTH NERVE PARALYSIS OF OTITIC ORIGIN: GRADINEGO'S SYNDROME.<sup>1</sup>

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DURING the years of 1916 and 1917 I have had the opportunity of observing 2 cases illustrating this unusual complication of otitis. In the first case the appearance of the ocular paralysis caused considerable apprehension, as I was unfamiliar at the time with the type of case so fully described by Gradinego. The second case, coming a year later, after I had had an opportunity of familiarizing myself with Gradinego's paper, was very interesting, but did not cause the same anxiety on account of the favorable course which he has found usual in these cases. In presenting the two cases I have taken the opportunity of giving a synopsis of the original paper, which I feel will be of interest to any of the members who are not already familiar with it.

In 1904 Gradinego reported<sup>2</sup> a series of cases in which the three cardinal symptoms, suppurative otitis, severe pain referred to the side of the head, and paralysis of the sixth nerve, were present in combination. There were 5 cases of his own and others collected from literature.

The publication of his paper caused considerable discussion, and there was some doubt expressed as to whether the sixth nerve paralysis was really a complication of the otitis or a coincident symptom from some associated condition, such as suppuration of the sphenoid or an independent cranial nerve palsy.

In 1907 Gradinego<sup>3</sup> published a further paper on the subject and collected a series of 57 cases which illustrated his syndrome and established it as a definite clinical type. This syndrome he explains by the hypothesis of a localized meningitis from extension of the middle-ear suppuration through atypical pneumatic cells connected with the region of the Eustachian tube and extending more or less completely to the tip of the pyramid. These cells have been

<sup>1</sup> Presented at the Canadian Medical Association Meeting, Quebec, P. Q., June 26, 1919.

<sup>2</sup> Arch. f. Ohren., 1904.

<sup>3</sup> Ibid., 1907, vol. lxxiv.

described by various authors, but perhaps most beautifully demonstrated by Siebenmann, of Basel, by his corrosion method.<sup>4</sup>

Gradinego's work is of great interest as explaining the somewhat unusual complication of sixth nerve involvement by otitis and also as indicating a group of cases which, if neglected, may go on to a diffuse meningitis and death.

Reviewing the 57 cases he was able to classify them into three groups:

In the first group were 24 cases which showed a classical syndrome without other complicating features, beyond perhaps more or less inflammation of the mastoid. These cases ran a favorable course to complete healing and recovery.

In the second group there were 29 cases showing a typical syndrome but complicated by other lesions, such as seventh nerve paralysis, labyrinth irritation or optic neuritis, which he regarded as independent complications of the otitis rather than characteristic of the lesion by which he explains his syndrome.

In the third group were 4 cases which, in addition to showing the syndrome, later developed septic meningitis and died. He regards these as a more virulent type in which the process extends to diffuse meningitis; the second group illustrates an intermediate stage between the first and third.

The characteristic features of the syndrome are mentioned in detail:

**ACUTE SUPPURATIVE OTITIS.** Usually the otitis in these cases is characterized by evidence of retention of pus in the middle ear, either complete or relative. This is indicated by absence of or insufficient perforation of the drum. In 32 cases in which details are given eighteen times there is no perforation, or there was late spontaneous perforation, or paracentesis was done late. The perforation was generally too small, so that it required subsequent paracentesis. Sometimes this was repeated as many as five times. It was also striking that the situation was frequently in the anterior half of the drum. Paracentesis, or enlargement of the perforation, was generally followed by a striking remission of the symptoms, pain and paralysis thus showing a definite relationship between the otitis and the paralysis of the sixth nerve. This remission of the paralysis after middle-ear drainage was well shown in my first case.

**SEVERE PAIN.** Severe pain was referred to the temporal and parietal regions of the side involved. The otitis is characteristically accompanied by very severe pain, which, however, may subside a few days after the appearance of the discharge. This is referred to the deeper parts of the ear, or more characteristically, to the side of the head, occasionally to the retroorbital region. It is not characteristic of a fifth nerve neuralgia, which is paroxysmal, but is

<sup>4</sup> Anatomy of the Middle Ear, etc., Bardeleben's Handbook.

more intense and continuous and is little relieved by antineuralgic remedies. It sometimes appears two or three weeks after the discharge at the time of the appearance of the paralysis.

**PARALYSIS OF THE SIXTH NERVE.** This symptom appears suddenly without warning, the patient sometimes complaining of a diplopia, and calls the attention of the physician to it. Paralysis does not usually appear early. In the 37 cases in which the exact appearance was noted: Three times it appeared early on the fifth to the tenth day; eight times it appeared from the fifteenth to the twentieth day; twenty times it appeared from the twentieth to the fiftieth day. Occasionally it is late; in 6 cases it was after the fifty-sixth day. It may be stated, in general terms, as occurring from three to six weeks after the beginning of the otitis. In the typical cases complete recovery usually occurs, but is liable to be slow. There are unusual cases in which the paralysis disappears rapidly, and to this type both of my cases belong.

The complicating symptoms of the second group were suggestive of a meningeal irritation.

**COMPLICATIONS IN THE MASTOID.** Complications in the mastoid were regarded as associated with a severe otitis, but having no direct bearing on the syndrome. In the 57 cases there were only 24 in which a mastoid operation was done; usually it was for the purpose of free drainage of the middle ear rather than for the relief of symptoms pointing to a mastoid involvement. The findings in the mastoid at operation were usually an inflamed mastoid without severe local disease, although in some cases there was mastoid abscess or even a perisinus abscess.

The seventh nerve paralysis, when present, was regarded as an independent manifestation, probably from involvement of the nerve in the region of the middle ear.

Certain features, such as the late appearance of the paralysis, are explained by the disease lying latent in the pneumatic cells of the pyramid, just as we often find foci remaining latent in the pneumatic cells of the mastoid and later setting up active trouble.

Other theories which have been advanced to explain the sixth nerve paralysis are found untenable.

It has been suggested that on account of the relations of the labyrinth to the ocular muscles it might arise in some way by labyrinth involvement. Characteristically, however, there is no involvement of the labyrinth in these cases.

It has also been suggested that we might have here an associated neuritis of the sixth nerve. The condition, however, occurs too constantly as part of the syndrome and the relation with the otitis is too definite for such an explanation.

In 2 cases there was a history of syphilis or a positive Wassermann reaction, but even in these the paralysis was quite uninfluenced by

antisyphilitic treatment, and the syphilis was regarded as an accidental finding, with no direct bearing on the symptoms.

The history of my own cases was as follows:

CASE I.—J. R., male, aged twenty-two years, consulted me on May 1, 1916, complaining of profuse discharge from the left ear.

*Onset of Illness.* Illness began two weeks ago, with very severe earache and headache, followed a few days later by discharge. The pain, however, was not relieved by the discharge and two days ago it was again very severe and accompanied by considerable fever.

*Present Condition.* On the examination the patient is a poorly nourished individual and looks ill, but shows no elevation of temperature. The left ear shows profuse mucopurulent discharge, which is pulsating. The drum membrane is injected and shows a perforation in the lower anterior part of fairly large size, suggesting chronic perforation. There is a slight fulness of the upper part of the drum and some slight swelling in the wall of the canal; there is no pain or mastoid tenderness.

The case was put on conservative treatment, frequent syringing with hot boric lotion, and for ten days there were no unusual symptoms. It must be stated, however, that the patient was of a rather sluggish mental type, and it is possible that pain might have been present without his complaining about it.

On May 10, about three weeks after the onset of the otitis, it was noted there was a paresis of the left external rectus. I referred the patient to Dr. McAuley for a report on the eyes, and his report stated that beyond a paresis of the left external rectus there was nothing abnormal to be made out. The fundus was normal.

The following day there seemed to be some increase in swelling in the canal and I decided to drain the mastoid. The outer table was very thick, the cells of the mastoid were small, filled with pus, but no marked destructive process in the bone. Following the operation there was a persistence of discharge from the canal, suggesting that the mastoid drainage had not been sufficient to relieve the supuration of the middle ear. The condition improved for a day or so and the paralysis was less marked, but on May 23, probably from the obstruction of the aditus by granulations, the paresis became decidedly more marked and there was a slight elevation in temperature. As the right ear was normal I decided to perform a radical mastoid operation to ensure the complete drainage of the whole tympanum. This was done on May 25. The middle ear was full of pus and swollen folds of mucous membrane.

On May 27, two days after operation, there was a very striking improvement in the paresis, which gradually disappeared, and on June 9 it was reported absent. The ear healed rather slowly, but on July 3 he was discharged healed, though there was still some slight mucous discharge from the region of the Eustachian tube.

The case belongs, I think, to the first group described by Gradinago

and illustrates a favorable outcome to what looked at the time to be a case going on to an intracranial complication.

CASE II.—M. O., female, aged twenty-eight years, was seen on April 30, 1917. The history was that her right ear had been sore for five weeks and had been discharging since April 5, a little over three weeks. Pain at onset had been severe for over two weeks, when a paracentesis had been done, with a certain amount of relief. For the past two or three days the discharge had been profuse and the pain had reappeared.

On examination her general condition was somewhat below par, her temperature being 100°. The right ear showed a somewhat congested drum, with a bulging nipple-like perforation, indicating retention. On the following day she was operated on, a simple mastoid operation being carried out. The cells were filled with swollen mucosa, but there were no marked changes in the bone. A free paracentesis was carried out at the same time, and there was evidence of a certain amount of retention in the middle ear. The wound healed rapidly and the discharge from the ear stopped a day or so after the operation.

On the third or fourth day after operation (about six weeks from the onset of the otitis) she developed a paresis of the right external rectus, but as the ear condition gave every evidence of satisfactory healing, no further interference was carried out, and the paresis disappeared spontaneously in three or four days.

This last case is interesting as illustrating the development of the paresis after the middle-ear condition was on the high road to recovery.

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**A CLINICAL PATHOLOGICAL STUDY OF AN UNUSUAL  
SYPHILITIC MANIFESTATION RESEMBLING  
JUXTA-ARTICULAR NODULES.**

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THE case which forms the material for the present study was seen more than a year ago, but the exigencies of the period delayed this report.

At the time this case was first seen an effort was made to find reference to a like condition in the available literature. Although mention of syphilis of the tendons was frequent enough, no study was found which compared with this case. We were led to believe